IN THE CLAIMS

1. (original) A method for reducing noise in a discrete pixel image, the method comprising the steps of:

(a) shrinking an initial image by a given factor to produce a shrunken image;

(b) reducing image noise by selectively processing one or more selected regions of the shrunken image and differentially processing one or more non-selected regions of the shrunken image such that a processed image results;

(c) expanding the processed image by the given factor to produce an expanded image;

(d) blending one or more selected regions of the expanded image with one or more corresponding regions of the initial image to produce a blended image; and

(e) correcting a plurality of intensity values of the blended image by differentially processing two or more regions.

2. (original) The method of claim 1, wherein the step of shrinking is accomplished by a sub-sampling technique.

3. (original) The method of claim 2, wherein the sub-sampling technique is pixel averaging.

4. (original) The method of claim 3, wherein the pixel averaging is non-overlapping.

5. (original) The method of claim 1, wherein the step of shrinking is accomplished by use of a boxcar filter.

6. (original) The method of claim 1, wherein the given factor is multi-dimensional and each dimensional factor is greater than or equal to one.

7. (original) The method of claim 1, wherein the selected regions are determined based upon a scaled threshold value.

8. (original) The method of claim 7, wherein the scaled threshold value is computed based upon an initial threshold value and a scaling factor input by a user.

9. (original) The method of claim 1, wherein in step (b) the selected regions comprise pixels having values below a first threshold value but above a second threshold value, and positioned adjacent to a pixel having a value at or above the first threshold value.

10. (original) The method of claim 9, wherein the first threshold is based upon a scaling factor selected by a user.

11. (original) The method of claim 1, wherein in step (b) the processing of selected regions comprises smoothing pixels based upon a dominant orientation and an orientation orthogonal to the dominant orientation.

12. (original) The method of claim 1, comprising the further step of smoothing image data contained in the shrunken image prior to identifying the selected regions.

13. (original) The method of claim 1, wherein in step (b) the processing of selected regions comprises directional sharpening of pixels in the selected region having a value above a desired lower limit value.

14. (original) The method of claim 13, wherein the process of sharpening comprises comparing a sharpened pixel in the selected region to one or more thresholds and limiting the value of the sharpened pixel to the threshold value where the sharpened pixel value exceeds the threshold value.

15. (original) The method of claim 1, wherein the step of expanding is accomplished using an interpolation technique.

16. (original) The method of claim 15, wherein the interpolation technique is cubic interpolation.

17. (original) The method of claim 1, wherein in step (d) the blending of one or more selected regions comprises one region comprising the one or more selected regions of step (b) and one region comprising the one or more non-selected regions of step (b).

18. (original) The method of claim 1, wherein in step (d) the blending of one or more selected regions with the one or more corresponding regions may occur in different proportions for different selected regions.

19. (original) The method of claim 1, wherein in step (e) the two or more selected regions are selected by a mask.

20. (original) The method of claim 19, wherein the mask is formed by determining a minimum intensity value from among a plurality of pixels having individual intensity values and designating a first region comprising those pixels with intensity values equal to the minimum intensity value and a second region comprising those pixels with intensity values exceeding the minimum intensity value.

21. (original) The method of claim 20, wherein a first binary erosion is performed on the second region to form a third region comprising a fraction of the second region.

22. (original) The method of claim 21, wherein a second binary erosion is performed on the third region to form a fourth region comprising a fraction of the third region.

23. (original) The method of claim 22, wherein one or more subsequent binary erosions are performed to form one or more additional regions each comprising a fraction of the third region.

24. (original) The method of claim 1, comprising the further step, prior to the step of shrinking, of determining a minimum intensity value from among a plurality of individual intensity values of an initial image and adding the minimum intensity value to each individual intensity value of the initial image.

25. (original) The method of claim 24, comprising the further step, after the step of correcting, of subtracting the minimum intensity value from each individual intensity value of the corrected image.

26. (original) The method of claim 1, comprising the further step, after the step of correcting, of subtracting a constant from each individual intensity values of the corrected image.

27. (original) The method of claim 26, wherein the constant is empirically determined based upon a user configurable parameter.

28. (original) The method of claim 27, wherein the user configurable parameter is a filter setting.

29. (currently amended) A method for reducing noise in a discrete pixel image, the method comprising the steps of:

(a) sub-sampling an initial image containing image data representative of pixels of a reconstructed image such that a shrunken image results and such that the initial image is shrunk by a factor greater than one;

(b) identifying one or more structural features from the image data represented in the shrunken image;

(c) smoothing the structural features to enhance ~~the~~ a dominant orientation of the structural features;

(d) smoothing non-structural region to enhance ~~the~~ a homogenization of the non-structural region;

(e) sharpening the structural features to enhance the dominant orientation associated with the structural features;

(f) expanding the shrunken image by the factor such that an expanded image results which has the same dimensions as the initial image;

(g) blending a fraction of the expanded image with image data from the first initial image to form a blended image; and

(h) correcting intensity values of the blended image by identifying two or more regions within the blended image and modifying each region differentially to form a corrected image.

30. (original) The method of claim 29, wherein the step of sub-sampling is accomplished by pixel averaging.

31. (original) The method of claim 30, wherein the pixel averaging is non-overlapping.

32. (original) The method of claim 29, wherein the step of sub-sampling is accomplished by use of a boxcar filter.

33. (original) The method of claim 29, wherein the factor is multi-dimensional and each dimensional factor is greater than or equal to one.

34. (original) The method of claim 29, wherein the structural features are determined based upon a scaled threshold value.

35. (original) The method of claim 34, wherein the scaled threshold value is computed based upon an initial threshold value and a scaling factor input by a user.

36. (original) The method of claim 29, wherein in step (b) the structural features comprise pixels having values below a first threshold value but above a second threshold value, and positioned adjacent to a pixel having a value at or above the first threshold value.

37. (original) The method of claim 36, wherein the first threshold is based upon a scaling factor selected by a user.

38. (original) The method of claim 29, wherein in step (c) the smoothing of structural features to enhance their dominant orientation includes smoothing pixels based upon a dominant orientation and an orientation orthogonal to the dominant orientation.

39. (original) The method of claim 29, comprising the further step of smoothing image data contained in the shrunken image prior to identifying the structural features.

40. (original) The method of claim 29, wherein in step (e) the sharpening of structural features to enhance their dominant orientation comprises the sharpening of pixels in the structural features having a value above a desired lower limit value.

41. (original) The method of claim 40, wherein the process of sharpening comprises comparing a sharpened pixel in the structural features to one or more thresholds and limiting the value of the sharpened pixel to the threshold value where the sharpened pixel value exceeds the threshold value.

42. (original) The method of claim 29, wherein the step of expanding is accomplished using an interpolation technique.

43. (original) The method of claim 42, wherein the interpolation technique is cubic interpolation.

44. (original) The method of claim 29, wherein in step (g) the fraction comprises two or more portions such that the two or more portions are blended in different proportions.

45. (original) The method of claim 44, wherein one portion comprises the structural features and one portion comprises the non-structural region.

46. (original) The method of claim 29, wherein in step (h) the two or more regions are selected by a mask.

47. (original) The method of claim 46, wherein the mask is formed by assigning each pixel a region based upon the pixel's representative position within a computed tomography imaging circle.

48. (original) The method of claim 29, comprising the further step, prior to the step of sub-sampling, of determining a minimum intensity value of an initial image and adding the minimum intensity value to each pixel of the initial image.

49. (original) The method of claim 48, comprising the further step, after the step of correcting, of subtracting the minimum intensity value from each pixel of the corrected image.

50. (original) The method of claim 29, comprising the further step, after the step of correcting, of subtracting a constant from each pixel.

51. (original) The method of claim 50, wherein the constant is empirically determined based upon a user configurable filter setting.

52. (currently amended) A system for reducing noise in a discrete pixel image, the system comprising:

an output device for producing a reconstructed image based upon processed image data; and

a signal processing circuit configured to provide processed image data by sub-sampling an initial image to produce a shrunken image, identifying one or more selected regions of the shrunken image using one or more selection criteria, differentially processing the selected regions and ~~the~~ one or more non-selected regions ~~in different manners~~ to create a processed image, expanding the processed image to the same dimensions as the initial image, blending a fraction of the expanded image data with the initial image data, and differentially correcting intensity values in two or more regions of the blended image using an image mask.

53. (original) The system of claim 52, further comprising an image data acquisition system for producing image data signals processed by the signal processing circuit.

54. (original) The system of claim 53, wherein the image data acquisition system comprises a computed tomography system.

55. (original) The system of claim 52, wherein the selected region is determined based upon a scaled threshold value.

56. (original) The system of claim 55, wherein the scaled threshold value is computed based upon an initial threshold value and a scaling factor input by a user.

57. (original) The system of claim 52, wherein the selected region comprises pixels having values below a first threshold value but above a second, lower threshold value, and positioned adjacent to a pixel having a value at or above the first threshold value.

58. (original) The system of claim 52, wherein the sub-sampling is accomplished by pixel averaging.

59. (original) The system of claim 58, wherein the pixel averaging is non-overlapping.

60. (original) The system of claim 52, wherein the step of sub-sampling is accomplished by use of a boxcar filter.

61. (original) The system of claim 52, wherein the sub-sampling factor by which the initial image is shrunk is multi-dimensional and each dimensional factor is greater than or equal to one.

62. (original) The system of claim 52, wherein the step of expanding is accomplished using an interpolation technique.

63. (original) The system of claim 62, wherein the interpolation technique is cubic interpolation.

64. (original) The system of claim 52, wherein the fraction of the expanded image data comprises two or more portions such that the two or more portions are blended in different proportions.

65. (currently amended) The system of claim 64, wherein one portion comprises the selected regions and one portion comprises the <u>one or more</u> non-selected regions.

66. (original) The system of claim 52, wherein the image mask is formed by assigning each pixel to a region based upon the pixel's representative position within a computed tomography imaging circle.

67. (original) The system of claim 52, wherein the signal processing circuit is further configured to provide processed image data by adding a minimum intensity value to each of the individual pixels of an initial image prior to sub-sampling the initial image.

68. (original) The system of claim 67, wherein the signal processing circuit is further configured to provide processed image data by subtracting the minimum intensity value from each of the individual pixels of the corrected image.

69. (original) The system of claim 52, wherein the signal processing circuit is further configured to provide processed image data by subtracting a constant from each of the individual pixels of the corrected image.

70. (original) The system of claim 69, wherein the constant is empirically determined based upon a user configurable filter setting.

71. (original) A system for reducing noise in a discrete pixel image, the system comprising:

an output device for producing a reconstructed image based upon processed image data; and

a signal processing circuit configured to provide processed image data by sub-sampling an initial image to produce a shrunken image, smoothing image data representative of pixels of the shrunken image, identifying one or more structural features from the smoothed image data, orientation smoothing the structural features, homogenization smoothing non-structural regions, orientation sharpening the structural features, expanding the shrunken image to the same dimensions as the initial image to form an expanded image, blending of the initial image data into the expanded image data, and differentially correcting intensity values in two or more regions of the blended image using an image mask.

72. (original) The system of claim 71, further comprising an image data acquisition system for producing image data signals processed by the signal processing circuit.

73. (original) The system of claim 72, wherein the image data acquisition system comprises a computed tomography system.

74. (original) The system of claim 71, wherein the structural features are determined based upon a scaled threshold value.

75. (original) The system of claim 74, wherein the scaled threshold value is computed based upon an initial threshold value and a scaling factor input by a user.

76. (original) The system of claim 71, wherein the structural features include pixels having values below a first threshold value but above a second, lower threshold

value, and positioned adjacent to a pixel having a value at or above the first threshold value.

77. (original) The system of claim 71, wherein the orientation smoothing is based upon a dominant orientation and an orientation orthogonal to the dominant orientation.

78. (original) The system of claim 71, wherein orientation smoothing is performed based upon a predetermined relationship between a characteristic of each structural pixel in the dominant orientation and in the orthogonal orientation.

79. (original) The system of claim 78, wherein the characteristic is a number of counts of orientations within a neighborhood of each structural pixel.

80. (original) The system of claim 71, wherein the sharpening is performed only for structural pixels having a value above a desired lower limit value.

81. (original) The system of claim 71, wherein the sub-sampling is accomplished by pixel averaging.

82. (original) The system of claim 81, wherein the pixel averaging is non-overlapping.

83. (original) The system of claim 71, wherein the step of sub-sampling is accomplished by use of a boxcar filter.

84. (original) The system of claim 71, wherein the sub-sampling factor by which the initial image is shrunk is multi-dimensional and each dimensional factor is greater than or equal to one.

85. (original) The system of claim 71, wherein the step of expanding is accomplished using an interpolation technique.

86. (original) The system of claim 85, wherein the interpolation technique is cubic interpolation.

87. (original) The method of claim 71, wherein the blended image data comprises two or more portions such that the two or more portions are blended in different proportions.

88. (original) The method of claim 87, wherein one portion comprises the structural features and one portion comprises the non-structural region.

89. (original) The system of claim 71, wherein the image mask is formed by assigning each pixel to a region based upon the pixel's representative position within an imaging field.

90. (original) The system of claim 89, wherein the imaging field is a CT imaging circle.

91. (original) The system of claim 71, wherein the signal processing circuit is further configured to provide processed image data by adding a minimum intensity value to each of the individual pixels of an initial image.

92. (original) The system of claim 91, wherein the signal processing circuit is further configured to provide processed image data by subtracting the minimum intensity value from each of the individual pixels of the corrected image.

93. (original) The system of claim 71, wherein the signal processing circuit is further configured to provide processed image data by subtracting a constant from each of the individual pixels of the corrected image.

94. (original) The system of claim 93, wherein the constant is empirically determined based upon a user configurable filter setting.